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ABSTRACT

A system which lists current research in Israel in the natural sciences, medicine, agriculture and technology was inaugurated in 1967. This system now includes 4,000 current research projects on which 3,500 individual researchers are engaged. This represents about 90% of all scientists doing non-defense research in Israel. The system is run on an IBM 360/30 model computer and updated periodically. Individual questionnaires completed by the scientists serve as input and a printed directory is produced as output. The research projects are classified by an expanded COSATI Subject Heading List. Three indexes - of researchers, organizations and an edited KWOC (Keywords-Out-of-Context) index of titles - provide multiple approaches to the text. The administration of the system, its input, output and computer operation are described in detail. The system's value to information suppliers and users is discussed, and features characteristic to it are described. [Not available in hard copy due to marginal legibility of original document.] (Author)

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CONTRIBUTIONS TO INFORMATION SCIENCE

No. 2

ISRAEL SOCIETY OF SPECIAL LIBRARIES AND INFORMATION CENTRES

ISLIC

C. Keren, B. Arbel, N. Fichman, H. Parnes

A COMPUTER-PRODUCED INDEX TO CURRENT SCIENTIFIC RESEARCH IN ISRAEL

LI 002444

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Tel-Aviv
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2. A computer-produced index to current scientific research in Israel, by C. Keren, B. Arbel, N. Fichman, and H. Parnes. 1969.

3. An international center for standards documentation, by H. Wellisch. 1969.

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This Monograph, based on the procedures adapted for the preparation of the Directory of Current Research in Israel, published by the Center of Scientific and Technological Information, was originally announced for publication in January 1968.

Due to changes to be made in the 1969 edition of the Directory it seemed advisable to delay the publication of this monograph until additional experience, gained from the preparation of its first edition, could be incorporated.

[The 1969 edition of the above Directory has now been published and can be obtained from the Center, P.O.B. 20125, Tel-Aviv, Israel. Price IL. 75.- or $ 27.50].

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A system which lists current research in Israel in the natural sciences, medicine, agriculture and technology was inaugurated in 1967. This system now includes 4,000 current research projects on which 3,500 individual researchers are engaged. This represents about 90% of all scientists doing non-defence research in Israel.

The system is run on an IBM 360/30 model computer and updated periodically. Individual questionnaires completed by the scientists serve as input and a printed directory is produced as output. The research projects are classified by an expanded COSATI Subject Heading List. Three indexes - of researchers, organizations and an edited KWOC (Keywords-Out-of-Context) index of titles - provide multiple approaches to the text.

The administration of the system, its input, output and computer operation are described in detail. The system's value to information suppliers and users is discussed, and features characteristic to it are described.

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INTRODUCTION

The provision of well functioning and efficient scientific and technological information systems requires - inter alia - knowledge of the information resources which are readily accessible to the actual or potential users of the systems. Only if such knowledge is available and continually updated can a formal or informal communication process in science take place.

A prime information source is the personal knowledge of a researcher. In pursuing his line of investigation, he has acquired relevant information which is second to none. This personal knowledge is best expressed in the description of the research projects submitted by the researcher himself. The accumulation, over a period of time, of information about these projects should be the principal goal of any information system.

To summarize, any information service which strives for interaction between users and an information store needs an up-to-date record of current research. In view of this line of reasoning, the Center has devoted much of its time and means towards the production of the Directory described in this report.

In planning the Directory, existing systems in other countries were studied from organizational and operational viewpoints. The Science Information Exchange (SIE) in the U.S. closely resembles, in purpose and practice, what was considered to be necessary for the scientific and technical community of Israel. Its purpose is to collect and disseminate information on research in progress in order to help scientists and engineers keep up with the latest trends, avoid duplicating work underway elsewhere, and identify specialists in a specific field. Projects are voluntarily registered by Federal agencies, private foundations, universities, state and city agencies, information centers, and industry. Information from the project reports is stored on a computer for later retrieval in response to inquiries. The SIE deals with over 100,000 projects yearly which practically dictates a computerized, responsive system designed to provide information on request. However, in Israel only about 4,000 research projects outside the defence field are current at any time. Thus quantitative as well as economic considerations, and the goal of placing information in the hands of the users, led to the decision to produce a printed Directory at regular intervals. A service for supplying more comprehensive information is available from the Center of Scientific and Technological Information, but actually the Directory provides most of the information considered necessary initially.

The first edition of the Directory of Current Research in Israel, was published in 1967. It was devised as an instrument for providing basic

information on research projects in the natural and life sciences, including medicine, agriculture and technology, currently proceeding in Israel.

The number of indexes planned indicated that, even for the first edition the use of a computer would be economically feasible even though its use would be initially limited to storage, updating, extracting and sorting of indexing terms, and publishing rather than as part of a responsive retrieval system.

Publication in the English language was preferred since it permits the use of the Directory internationally and gives basic information on research in Israel.

The Directory has now been printed in its second edition and the system employed in its production can be considered to be finalized. As the input to the Directory relies mainly on the voluntary cooperation of researchers and institutes no claim can be laid to total comprehensiveness. Defence related research was entirely excluded from the printed version and a small proportion of researchers, particulary in industry did not respond to the questionnaire. The majority of research workers in Israel are found in Universities and Government sponsored institutes, while only a relatively small percentage are employed in industry. The considerable emphasis on basic (and medical) research causes project descriptions to be long-lived compared with those for technological R&D projects which are generally of shorter duration. Mention is made of this point because it explains some of the updating procedures which will be described later in this report.

Considering the total number of 3,429 researchers who responded and comparing this with the number of active scientists as reported by the Committee to inquire into the Organization and Administration of Governmental Research, December 1968, (6) and other statistics of scientific manpower, it would appear that the second edition now reports on at least 90% of the civilian research in the country.

DESCRIPTION OF THE DIRECTORY

The Directory contains four parts designed to provide the user with various approaches to the information for which he is searching.

The first and main section of the Directory is a listing of all reported research projects arranged by the appropriate subject fields. It is designed to provide the most information in the least space, and to serve as a retrieval or browsing tool for the user. In this section, COSATI subject area designations and corresponding terms are followed by the title of the research project, the names of the researcher or researchers, organization or organizations involved in the research, classes or subjects other than the one under which the project is published, and the internal reference number by which the project is identified at the Center. A sample of this section of the Directory is shown as Figure 3 in Appendix B.

Each project is listed only once, in alphabetical order by title, under the subject field which most closely characterizes it. The major subject field is subdivided to the third level in order to provide as much detail as possible within the general classification scheme employed. The use of COSATI Subject Categories for this purpose and details of the classification system are discussed below.

Preceding each major category, a divider sheet shows the breakdown of the major subject heading (see Fig.2 - App.B).

Three separate sections, containing only a minimum of information, follow the main section of the Directory. The first is an alphabetical listing of the organizations whose research is reported, and a translation of the mnemonic codes used in the first section (see Fig.4 - App.B). This listing is followed by an index (see Fig.5 - App.B) summarizing - by subject classification - the areas of research conducted in each organization. It should be pointed out that organizations are described as in as much detail as possible. Universities are broken down by faculties and schools, and research institutes by departments.

The second of these sections is an alphabetical index to researchers with reference to the numerical designation of the subject area assigned to the research projects in which they are involved. (See Fig.6 - App.B).

The third is the keyword (KWOC) index, indicating keywords, full title and the subject field (see Fig.7 - App.B). This index is designed to provide information on a given research project in addition to that provided by the main classification. Projects may be retrieved - with the aid of this index - by geographical names, formulae, names of techniques

employed, etc. - i.e., retrieval tools which general classification schemes usually ignore. The KWOC index will be dealt with in detail later in this report.

An additional index which is part of the system is not published for reasons of economy and space. This is a cross reference of classes under which the research project was indexed but not listed. In the publication proper the subject field breakdown and the KWOC index were considered sufficient for locating desired information.

PROCEDURES FOR COMPILING THE DIRECTORY

Gathering the data for such an undertaking as the Directory is a large task - even when only about 4,000 research projects are involved. Directors of laboratories and academic secretariats of the institutions of higher learning were required to participate and advertisements were carried in the newspapers. A card index was subsequently prepared including the names of all researchers identified and questionnaires were mailed to each one individually. Through very extensive cross-checking a reasonable response rate was achieved in academic institutions and large laboratories. Response from industry was much less reliable and the decision has therefore been taken not to include most of this sector in the Directory, although the data is maintained and updated at the Center.

Preparations for the second edition began soon after the first edition was published. Names of researchers and their addresses were repeatedly updated so that a revised mailing list was constantly on file.

Two types of questionnaires, completed by the individual researcher, are used to gather data for the Directory. Each questionnaire bears an arbitrary, unique, preprinted number. This number serves for follow up purposes and also eases communication when details are cleared up by phone or mail.

The first questionnaire (see App. A-1) is used for reporting new research. Three copies of this questionnaire are sent to the researcher; one is to remain in his files, two are to be returned to the Center for processing.

The form asks:

1) the subject of the research project and where possible, the researcher's suggested keywords

2) the name or names of the researchers involved, with the project leader noted, and the organizations in which the research project is being carried out

3) source of financing of the research project

4) an abstract of the research project with keywords selected for preparation of the KWOC. The abstract is required for classification of the project and for the preparation of additional information maintained at the Center, but not included in the Directory

5) approval of partial or full publication of the contents of the questionnaire

The second questionnaire (see App. A-2) is an up-dating form on which details of the research project as it appeared in the previous directory are printed out by the computer. The address is printed at the same time by the computer. The forms are sent to the researcher, who is requested to make any corrections of errors, note any changes in the names of researchers, and indicate whether the project is continuing, completed or discontinued. As in the case of the questionnaire on new research projects, this form is also sent out in three copies, two to be returned to the Center.

A researcher who has had a research project in a previous edition is thus sent a questionnaire of the second type (App. A-2) requesting the present state of validity for this project, and a questionnaire of the first type (App. A-1) to report any new research projects in which he is involved. A researcher whose name has been included, through any source, in the Center's address file, but who was not represented in a previous edition, is supplied with the first questionnaire only.

As a rule only projects which are carried out in Israel and or by researchers residing in the country are included. The exception to this rule is when a locally conducted project has not been terminated but the researcher has gone abroad for a new assignment.

As the questionnaires are received they are checked for completeness but are not professionally edited. Spelling of researchers' names is checked against the card index maintained in the Center. Details submitted in Hebrew on the bilingual questionnaire are translated into

English, but apart from this process no changes are made in the information as it is provided by the researcher. Each project is assigned an arbitrary number, shown as the internal reference number in the main index of the Directory, by which additional information may be retrieved.

One copy of the questionnaire is retained at the Center for control purposes, while the second copy is sent to the classifier who assigns the subject class or classes. These classifiers are subject specialists in the various areas covered by the research and are usually on the staff of one of the country's Universities. Many of them are at Ph.D. level and are assuming this responsibility in addition to teaching or research at their respective universities.

A chart showing the administrative procedures involved in producing the Directory may be found in Appendix A-3).

THE CLASSIFICATION SYSTEM USED

A general classification scheme, easy to use and understand, has been applied here since the directory is intended to be of use to researchers and managers as well as librarians or information scientists.

An underlying principle of the Center's operation is to use, wherever possible, existing schemes or systems which can be adapted to its needs. Even if such systems are not perfectly suitable, their use is to be preferred to the development of new ones and the consequent additional proliferation of information retrieval tools. Striving for perfection in individual systems often obscures the fact that they have to be mutually compatible - nationally and internationally - and that compromises are often necessary in order to achieve this. Only when this is kept in mind, can limited means be used most efficiently for the advancement of information technology.

The system described here covers R&D on a national scale and its range of subjects is therefore very broad. Any change in science policy or funding policy reflects in the subject coverage and thus a general classification scheme is necessary. Such a scheme naturally tends to group together items of a diverse nature. However, it is considered that if - in a directory - these groupings do not exceed 25-30 entries, they are easily scanned by the eye. This is preferred to a system which enters in great detail or requires specific knowledge for its application, especially for users who are not information specialists. The use of a general classification is also permissible when additional

indices are available for supplementary purposes as is true in the case of the Directory.

A number of schemes were considered before the COSATI Subject Category List (DOD Modified), 1965 (2) was selected as a basis for the classification system. (See Fig.1 - App.B). Even though the COSATI Category List is not complete, its very general construction made its use preferable to the compilation of a new thesaurus. It is universal, covering most branches of science in sufficient detail, and is easily adaptable to processing by computer. The UDC classification which would have been a likely choice of the more widely known schemes was rejected because, despite the investigations of T.W. Caless and D.B. Kirk (3) and R. Freeman and P. Atherton (4), the system is not yet wholly adapted to mechanization, and is not easily understood by non-librarians.

Under the COSATI system there are 22 principal subject areas with appropriate subdivisions. Both the principal subjects and the subdivisions are each assigned a two digit number in the DOD modified edition. A practical application to the scheme described here disclosed that a classification using even four digits would not suffice, and it was therefore expanded to six digits. The decision had been made earlier that in each sub-grouping there should be no more than thirty projects and without an extension to six digits this would not have been possible,

Since about 50% of the research projects in Israel are in the biological and medical sciences, it was necessary to go beyond the single COSATI category 06, which is not very detailed owing to the heavy emphasis given by COSATI to engineering and physical sciences. Bearing in mind the aim of using existing schemes as far as possible, two new groups - 50 (biology) and 51 (medicine) were created in form and with digit assignment which keeps the original format intact and replaces COSATI'S group 06 in this system. Additional groups were preferred rather than drastic changes within an existing group which would otherwise have been necessary. To facilitate searching - in this case to be done directly by users and not by means of questions to the computer - the general framework selected was retained and expansion made where necessary(Fig.8-App.B). "See", "Use", and "See also" references are used when questions arising within Israel could not, or might not, be met by the terminology used by COSATI.

The Index Medicus general scheme was used as a basis for medical subjects; in only a few instances were subjects added to the detailed list of terms. In chemistry, Current Chemical Papers, and to a lesser extent, Chemical Abstracts, were of assistance. For the field of physics, Physical Review Letters was used with only a few changes, and for agricul-

ture, the UDC dictionary was used.

In the COSATI system there are 208 Subject Headings of which 135 remained unchanged. 529 additional subject headings had to be added, though these do not represent a supplementation in the full sense of the word. In subjects such as Agriculture, Mathematics and Physics, it was necessary to add to the original scheme. Thus, in Agriculture, instead of the 6 subdivisions found in the COSATI system, 8 have been used. Of these 8, only 2 are identical with those suggested by COSATI. The same applies to the other subjects mentioned.

For the Directory a total of 666 subject Headings was used; research studies were classified under 470 of them. A total of 4,761 keywords appear in the second edition.

In all the sciences, the examination of the various classification methods employed and the necessary adjustments were carried out by subject specialists. The advice of these professionals was based both upon theoretical and experimental considerations. After proposing a modification of the existing tables the subject specialist attempted to classify a group of research projects according to the proposed modification. Only after he was completely satisfied as to its effectiveness and after the modification was reconciled with the existing framework was it incorporated into the general scheme.

DESCRIPTION OF KWOC

In most hierarchical systems of classification, it is possible to penetrate to a desired subject by beginning with the general and working to the specific. Where a specific or detailed answer is needed, such systems are often clumsy and a more appropriate solution might be attained through the use of keywords or descriptors, i.e. coordinate indexing. Such schemes, in order to be satisfactory, require an index of subjects (thesaurus) whose compilation entails strenous work on the part of numerous subject specialists, a lengthy period of time and a large financial investment. A cheaper and faster solution, albeit partial and superficial, is provided by use of the KWOC (Keywords-out-of-Context) or KWIC (Keywords-in-Context) systems.

The advantages and disadvantages of the KWIC system are summed up by Charles Bourne in his book entitled "Methods of Information Handling" (15) and will be referred to only briefly here. Under the KWIC system

keywords selected from the title are printed conspicuously on the page in alphabetical order in a vertical column. The remainder of each title occupies the rest of the same line. However, placing the keyword in position usually necessitates adjusting the placing of the whole title. It often starts in the middle of the line, is interrupted by the end of the line, and continues at the beginning in a wrap around effect.

Often neither the beginning nor the end of the title is clear in the KWIC system and rarely does it appear in its entirety. The same subjects appear a number of times quite needlessly or appear in both the singular and plural. This latter disadvantage is actually a partial advantage since it is clear that no professional skill is required for the preparation of the system. It is both rapid and simple and may be carried out entirely mechanically.

The main advantages of the KWOC system compared with the KWIC system were found to be:

In a KWOC printout the keyword is printed in a separate column to the left (or the right) of the title and the title is reprinted in full without any distortion.

By using KWOC a dictionary or concordance of keywords can be created which can then be used for additional processing.

Keywords produced by KWOC can be edited - all singulars can be converted to plurals or vice-versa, and vague terms such as, for instance, "development" which would not normally figure in an exclusion list, can be voided.

After a decision to use KWOC indexing was reached, the following operating instructions were imposed:

For reasons of economy and space a project description entry should not exceed 120 characters (one printed line). When necessary the computer program deletes words according to an exclusion list and substitutes full stops (.) or commas (,) to demonstrate that such a deletion has been made.

KWOC Keywords can be derived from both title and abstract (and even the body of a report) on the condition that the maximum number per research project does not exceed seven keywords. KWOC keywords which are not extracted from the title proper are reprinted in full (inside brackets) following the title.

Any single keyword is to be printed once only in the appropriate KWOC column. Titles relating to this specific keyword appear in one line entries to its right, in alphabetical order.

When the system was first employed (for the 1967 edition) all keywords were extracted by the computer and then manually edited. In the present edition (1969) this has been augmented and improved by requesting researchers to mark on their original entry-form those keywords which they consider most appropriate.

Exclusion lists of non-desirable keywords are constantly revised and enlarged by additional manual editing.

The extraction of valid keywords automatically builds a dictionary which may continuously be revised and enlarged. The advantage of this method of preparing the dictionary is that it is empirical, reflects the language of the scientist and, with each revised directory, new keywords are added to the existing store. The processing requires intellectual effort on a professional level, but if it is not very extensive, only a general familiarity with the subject area and the language may be required.

Keywords will also be used at a later stage for the construction of users' profiles. It seems highly probable that users retain a long-lived interest in topics which have been subject to actual research, and that SDI services based on profiles compounded from these topics might provide information with a high-relevance ratio.

MECHANIZATION OF THE SYSTEM

The information systems department at the Center has charge of the execution of this directory.

An IBM computer, model 360/30, is used for the establishment and maintenance of the Research Records File and in turn uses this file to extract, sort, and print information for the various indexes in the Directory.

Initially all programs were written in COBOL. When preparations for the second edition began, the building and extracting programs were rewritten in Assembler language with only the printing program remaining in COBOL. The following changes were introduced into the original package:

Several of the programs were constructed as general purpose ones, particularly the program constructing the dictionary and the one used to extract keywords. These programs can now be used for other needs of the Center.

Data is packed and considerably condensed under a new method of storage, and no limitation now exists on the length of names of individual researchers or keywords. In the old system there was a limit on each of these, in a fixed field format. Now a fixed field of up to 200 characters is reserved for all researchers and one of 170 characters for all of the keywords. In the new system, the title is limited to 220 characters.

In the original program, errors could be corrected only if the history of all changes in the record were known. This limitation is no longer valid. In the original, a period followed each word of the project title. In the revised program, a period is found only where nonessential words have been deleted to conform to the 220 character limit.

Equipment

The first and second editions of the Directory were run on the IBM 360/30. The minimum configuration for the system consists of four tape stations and two discs: DOS, SCRATCH.

The average cost per report of each research project is IL.20.-(US.$3.20). This price includes a share of the original programming costs such as salaries, data collection, keypunching, debugging, updating, and printing and administration. The price per entry is expected to decrease considerably with each new edition as a considerable part of the investment, especially for programs and debugging, need not be repeated.

DESCRIPTION OF MECHANIZED PROCESSES

A general flow chart of the system may be found in Appendix A-4.

Mechanization procedures begin with the transcription of the information from the questionnaires on regular encoding forms, subsequently keypunched and processed for the computer. Cards containing all new research data and corrections are converted to tape, sorted, checked, corrected and merged with the existing data tape. (For a description of the card formats,see Appendix A-6). The new data tape resulting from the merge is sorted to build a tape of Corrections and one of Additions. The Additions tape is then merged with the old Research Project file to create a new Research Project File, which is in turn corrected by a match against the Corrections tape. The resultant Corrected Research Projects file is then checked for duplicate titles and a report of the duplicates printed.

An extract program is used to extract data from the New Research Projects tape file and the Organizations' Symbols (on punched cards) file to create two temporary files: a file for the Main Report and a file of Researchers and Organizations. The researchers are extracted from the Researchers and Organizations file, sorted alphabetically and used to

print the Researchers Index. The Researchers and Organizations file is then sorted and run against the Organizations' Symbols punched card file to produce the Organizations' Index. The Organizations Symbols are printed direct from the punched card file.

The file for the Main Index is sorted first by subject classes and then alphabetically by title, and prints the Main Index. The print program permits a superimposed repetition of the printing of the names of the subject classes, thus providing a heavier print and making these headings stand out from the remainder of the text.

Finally the New Research Report File is matched against the Exclusion words dictionary (maintained on punched cards), creating a Keywords file. This file is used to print the Keywords Index. (For a description of all programs used in the system, see App. A-5).

Only the Research Projects file is permanent, all other files are temporary and required only for the printing of the various indices. For a description of the Research Projects file, see App. A-7.

FUTURE PLANS

Future goals of the system are concerned with the development of long range research profiles of researchers through steady accumulation of terms used in KWOC. After data has been accumulated for several years, a reliable picture of the fields of specialization of Israeli scientists and technologists and of the local scientific and technological potential will become evident. In this way, profiles of individual researchers will be developed in a systematic way and up-dated at regular intervals, in addition to the usual profiling interviews. SDI services will be provided through a match of these profiles against commercially available data files.

The Directory provides a profile of scientific and technological activities in the country as a whole and is thus a valuable tool for science policy makers. It will enable organizations providing grants for research in Israel to learn what, by whom and where, research studies are presently carried out in the country, who is an expert in which area, what is the specialization of a given institute, and similar data which assist in the optimum utilisation of scientific potential.

The system is already in use for reference services, including the provision of names of researchers expert in a given area, and this service will be expanded. Even in a small country with relatively few specialists available, one finds that locally available expertise is not always fully utilized.

SUMMARIZING DATA

TABLE # 1

Data on RESEARCHERS, RESEARCH PROJECTS and ORGANIZATIONS for the first and the second editions of the Directory.

	1967	1969
Number of Researchers	2,700	3,429
Number of Research Projects	3,062	3,965
Number of Organizations	137	305

TABLE # 2

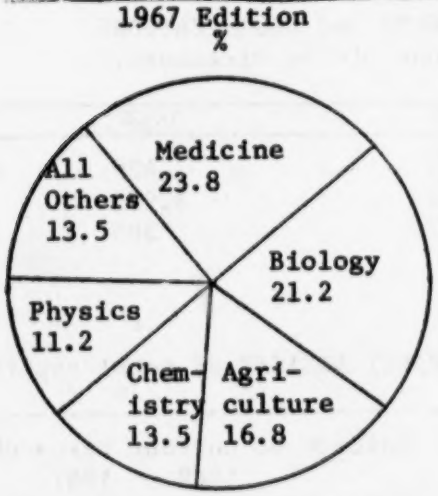
SCIENTISTS engaged in EACH OF THE MAIN SUBJECT AREAS (% of total reported)

Subject Area		Edition of current research	
		1969	1967
Class No.	Description	%	%
01	Aeronautics	0.4	-
02	Agriculture	12.3	12.6
03	Astronomy & Astrophysics	0.3	-
04	Atmospheric Sciences	0.9	0.6
05	Behavioral & Social Sciences	1.8	0.6
07	Chemistry	11.8	13.3
08	Earth Sciences & Oceanography	4.1	3.8
09	Electronics & Electrical Engrg.	1.6	0.7
10	Energy Conversion (non-propulsive)	0.3	0.5
11	Materials	1.8	1.0
12	Mathematical Sciences	2.6	1.1
13	Mech., Ind., Civil & Marine Engrg.	2.6	0.9
14	Methods & Equipment	0.3	0.2
17	Navigation, Communications, Detection & Countermeasures	0.2	0.1
18	Nuclear Sciences & Technology	0.9	0.8
20	Physics	10.3	10.7
21	Propulsion & Fuels	0.1	0.1
22	Space Technology	0.1	-
50	Biology	18.4	22.8
51	Medicine	29.2	30.2

A researcher usually works on two or three projects concurrently. On the average there are two to three researchers working on any one project, but there may be as many as eight.

TABLE # 3

Distribution of Reported RESEARCH PROJECTS by SUBJECT AREAS.



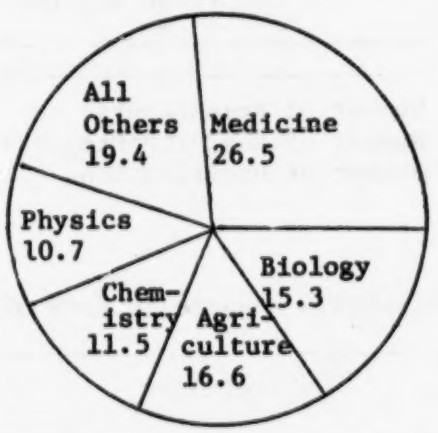


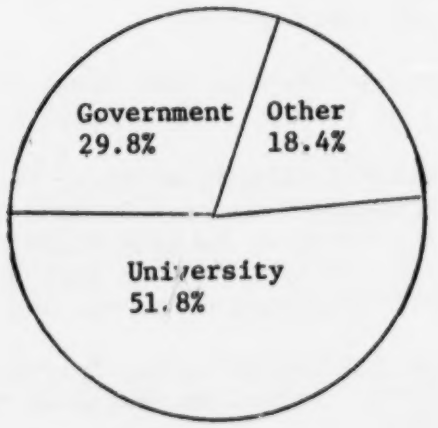
TABLE # 4

Breakdown of the "All Others" category of projects in Table # 3.

	Subject Area	1967 Edition %	1969 Edition %
08	Earth Sciences & Oceanography	5.4	4.3
13	Mechanical, Civil Engineering	1.3	2.9
09	Electronics	1.2	1.9
11	Materials	1.2	1.8
12	Mathematical Sciences	1.1	3.8
18	Nuclear Sciences	1.1	0.7
05	Behavioral & Social Sciences	0.7	1.6
04	Atmospheric Sciences	0.6	0.9
10	Energy Conversion	0.3	0.1
14	Methods & Equipment	0.2	0.2
21	Propulsion & Fuels	0.2	0.1
17	Navigation, Communications, Detection & Countermeasures	0.1	0.1
01	Aeronautics		0.7
03	Astronomy & Astrophysics		0.2
22	Space Technology		0.1

TABLE # 5

Distribution of Reported RESEARCH PROJECTS by SPONSORING ORGANIZATIONS.
(1969 edition)



The 305 organizations represented in the 1969 Edition show a large percentage of university sponsored research. The "Other" sector includes industry supported research (41%), primarily in the areas of agriculture, chemistry, earth sciences and oceanography, and research sponsored by public organizations, such as the Histadrut or Hadassah.

Concentration of university sponsored research is in medicine (51), biology (50), agriculture (02), physics (20) and chemistry (07), in this order. In government sponsored research, agriculture ranks highest, followed by medicine, biology and nuclear sciences(18). In the "Other" sector medicine represents over half, followed by agriculture and biology.

The number of researchers and research projects listed in the two editions published up to now do not allow any definite conclusions as to the scope of research activity in Israel. Such an investigation is anyway not the aim of the present report. However, those interested in science policy of Israel will find in the Directory a wealth of relevant data, and with further editions these data will become more refined and reliable.

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2. COSATI Subject Category List (DOD Modified), 1965. Washington, D.C., Defence Documentation Center, 1965.

3. An application of UDC to Machine Searching, by T.W. Caless and D.B. Kirk. Journal of Documentation, September 1967, pp. 208-215.

4. Audacious - an experiment with an on-line, interaction reference retrieval system using the Universal Decimal Classification as the index language in the field of nuclear science. In: American Society for Information Science, Proceedings, 5. Annual Meeting, October 20-24, 1968. Columbus, Ohio, pp. 193-199.

5. Center of Scientific and Technological Information, Scientific Research in Israel, 1969. Jerusalem, National Council for Research and Development, 1969.

6. Report of the Committee to inquire into the Organization and Administration of Governmental Research. December 1968.

7. Center of Scientific and Technological Information, Directory of Current Research in Israel. Tel-Aviv, Israel, the Center, 1969.

APPENDIX A:

1. Questionnaire for Reporting New Research
2. Up-dating Check Form
3. Flow-Chart of Administrative Procedures
4. Flow-Chart of Computer Process
5. Programs
6. Card Formats
7. Research Projects File Format

המועצה הלאומית למחקר ולפתוח
המרכז למידע טכנולוגי ומדעי
רח' החשמונאים 84, תל-אביב, ת.ד. 20125, טל. 37741

Questionnaire for
Reporting New Research
שאלון למחקר חדש
A-1

003910 *

הנחיות למלוי השאלון: (למעיין מצורף שאלון ממולא לדוגמא)
א. כל חוקר המשתתף במחקר ימלא שאלון.
ב. יש למלא שאלון נפרד עבור כל נושא.
ג. יש למלא שאלון גם לגבי מחקרים מקוריים המבוצעים ע"י משתלמים לתארים גבוהים.
ד. לקבלת הסברים נוספים ושאלונים נא לפנות אל משרדנו.

CURRENT RESEARCH REPORT 1968/69

I. COMPLETE PROJECT TITLE (in English)

א. השתמש במלים ובספרות ערביות בלבד. אל תשתמש בנוסחאות או בקצורים.
ב. מלות מפתח (KEYWORDS) - העבר קו מתחת למלים שהן בעלות משמעות ראשונית לתאור המחקר.

Immune Response in Cold Blooded Vertebrate:
T. Team Resp. in Carp (Cyprinus carpio)
" " " " Frog (Rana Ridibunda)

II. COMPLETE PROJECT TITLE (in Hebrew)

III. INVESTIGATORS

סמן √ במשבצת (*) אם החוקר הנו ראשי במחקר, ר"ס אם החוקר מחו"ל.

NAME (in English) Surname first max. 2 initials	NAME (in Hebrew) שם המשפחה במלואו וראי"ת של השמות הפרטיים	(*)	ORGANIZATION or INSTITUTION including DEPARTMENT
AVTALION R.R.	אבטליון רות	√	Bar Ilan University Dpt. of Microbiology
LEFLER E.	לפלר א.		

הערה: הפרטים שבהמשך השאלון הנם לשמוש פנימי בלבד ואינם מתפרסמים.

IV. RESEARCH SUPPORT

Source: הסתדרות הציונית - המחלקה לקליטת עליה ומרכז אוניברסיטאי בר אילן, לשנת מחקר

Amount: for 1968/69 ₪ 19,000 for 1969/70 ₪ — for 1970/71 ₪ —

V. RESEARCH DURATION

RESEARCH STARTED: Month — Year 1967 ESTIMATED DURATION ? Months.

VI. ABSTRACT (preferable in English)

תאר בקצרה את מחקרך, מטרתו, השלב הנוכחי, שיטות העבודה והממצאים האחרונים. אם אין די מקום צרף דף נוסף. העבר קו מתחת למלות מפתח (KEYWORDS).

[illegible]

VII. RESTRICTIONS. הגבלות

א. האם מותר לפרסם ברבים על ביצוע המחקר? (סמן א במשבצת המתאימה) כן [X] לא [ ]
ב. האם מותר לתת את התקציר לעיון למעוניינים? (סמן א במשבצת המתאימה) כן [X] לא [ ]

תודה על מלוי השאלון. הכנס נא 2 העתקים לתוך המעטפה המצורפת החזר אותה למשרדנו עד 1.4.1968.

חתימת ממלא השאלון: [signature] תאריך: 21.1.69

המועצה הלאומית למחקר ולפתוח
הכורכז למידע טכנולוגי ומדעי
ת. ד. 20125, תל-אביב

UPDATING CHECK FO

A-2

לכבי

KALIR A.
ORGANIC CHEMISTRY INSTITUTE FOR BIOLOGICAL RESEARCH
NES ZIYYONA, P.O.B. 19.

נ כ ב ד י,

משרדנו התחיל ב־1966 בתיעוד המחקר המדעי השוטף בישראל, בתחום מדעי הטבע והטכנולוגיה, ומעביר למטרה זו
סקרים תקופתיים. תוצאות סקרים אלה, מעובדות ע"י מחשב, יתפרסמו כ -
DIRECTORY OF CURRENT RESEARCH IN ISRAEL (Physical and Life Sciences)
שיופיע בקביעות ויופץ בארץ ובחו"ל. מדריך זה ייסייע בידי הגורמים המעוניינים להכיר את שטחי המחקר במדעי
הטבע, הרפואה, ההנדסה, החקלאות והטכנולוגיה, וכן את החוקרים העוסקים בהם.
ההוצאה הראשונה של המדריך הופיעה בנובמבר 1967 והתחלנו בהכנת המהדורה השניה.
לשם השלמת האינפורמציה בגבי מחקרך שהופיע במהדורה הקודמת, עידכונה ותיקון השיבושים שחלו בה, אנא עיין
ביטופס לתיקון פרטי המחקרים". מחק כל פרט הדורש תיקון ורשום את הנוסח המתוקן.
אם התחלת מחקר חדש, אנא מלא את הטופס הריק המצורף למטרה זו.
החזר אלינו 2 טפסים במעטפה המצורפת עד ל- 01/04/68
בתודה על ההענות

טופס לתיקון פרטי המחקרים השנה 1966/67 מס' 00002

במדריך הקודם דווחת על מחקר שנושאו:
SYNTHESIS OF TRYPTAMINES AND LSD-LIKE COMPOUNDS.

החוקרים שהשתתפו בו הם:
חוקר ראשי מסומן ב"*". סמן c במשבצות דלהלן אם ההוקר חדל לעסוק במחקר בכלל, ו"R אם הדל לעבוד על מחקר זה.

המוסד	השם	אנא כתוב את שמך בעברית:
המוסד	השם *	KALIR A. ORGANIC CHEMISTRY INSTITUTE FOR BIOLOGICAL RESEARCH
המוסד	השם R	SADEH Z. ORGANIC CHEMISTRY INSTITUTE FOR BIOLOGICAL RESEARCH
המוסד	השם	
המוסד	השם	
המוסד	השם	
המוסד	השם	
המוסד	השם	
המוסד	השם	
המוסד	השם	

אנא ענה על השאלות הבאות:
1. האם המחקר הסתיים כן ☒ לא ☐ 2. האם התחלת מחקר חדש כן ☐ לא ☐ אם כן מלא טופס דיווח מיוחד.

24

23

A-2 (cont.)

FORM FOR CORRECTION OF DETAILS OF RESEARCH STUDIES For Year No.

In the preceding Directory you reported on a research study on the subject of:

THE RESEARCHERS WHO PARTICIPATED IN IT WERE:

Chief Researcher marked with * Enter C in squares below if the researcher is no longer engaged in research work, and R if he has ceased activity on this research

---

Please write your name in Hebrew:

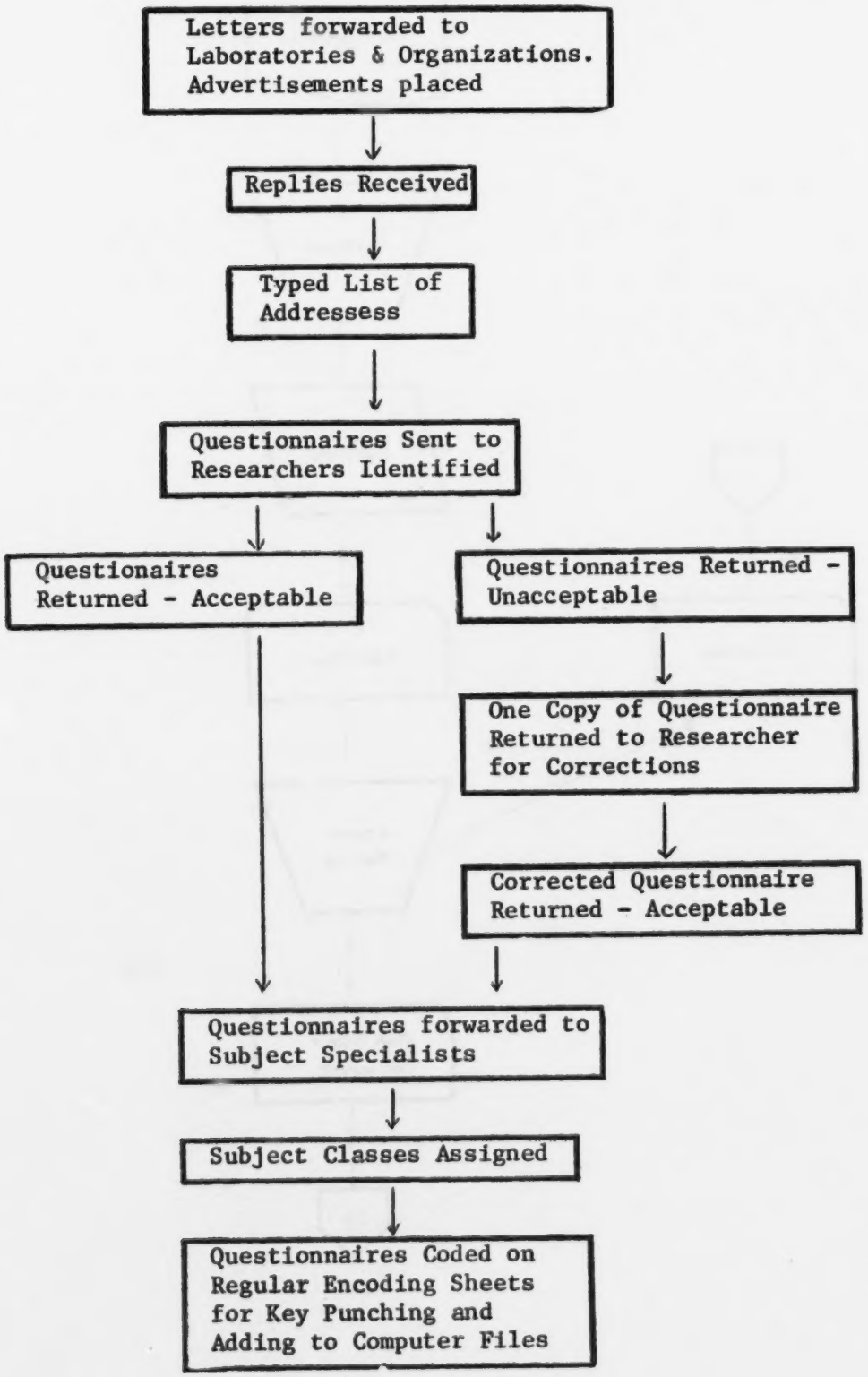
Name ... .

Institution Name

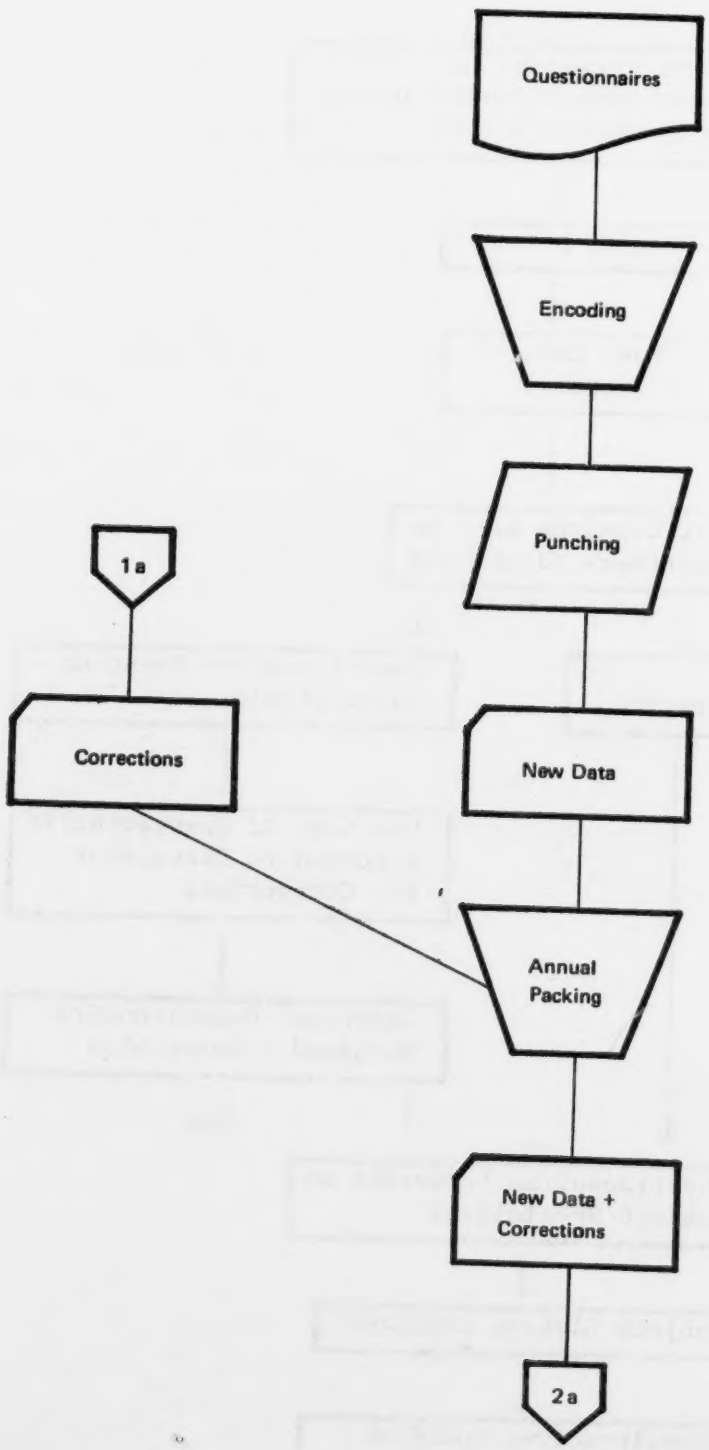
PLEASE REPLY TO THE FOLLOWING QUESTIONS

1. Has the research been completed? Yes __ No __ 2. Have you commenced new research Yes __ No __. If so, fill out the attached blank form.

FLOW-CHART OF ADMINISTRATIVE PROCEDURES A-3

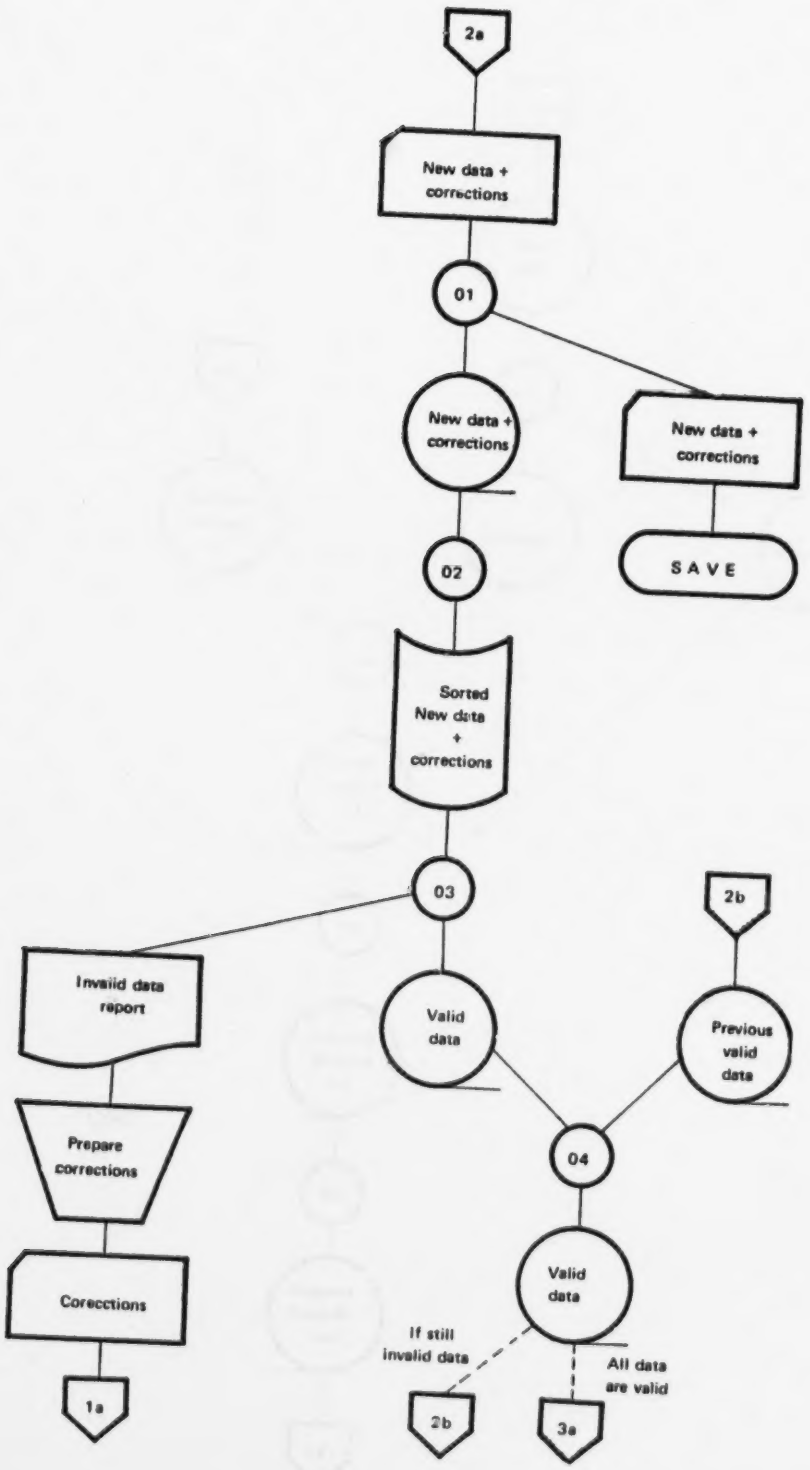

Letters forwarded to Laboratories & Organizations. Advertisements placed
Replies Received
Typed List of Addressess
Questionnaires Sent to Researchers Identified
Questionaires Returned - Acceptable
Questionnaires Returned - Unacceptable
One Copy of Questionnaire Returned to Researcher for Corrections
Corrected Questionnaire Returned - Acceptable
Questionnaires forwarded to Subject Specialists
Subject Classes Assigned
Questionnaires Coded on Regular Encoding Sheets for Key Punching and Adding to Computer Files

FLOW CHART OF COMPUTER PROCESS A-4



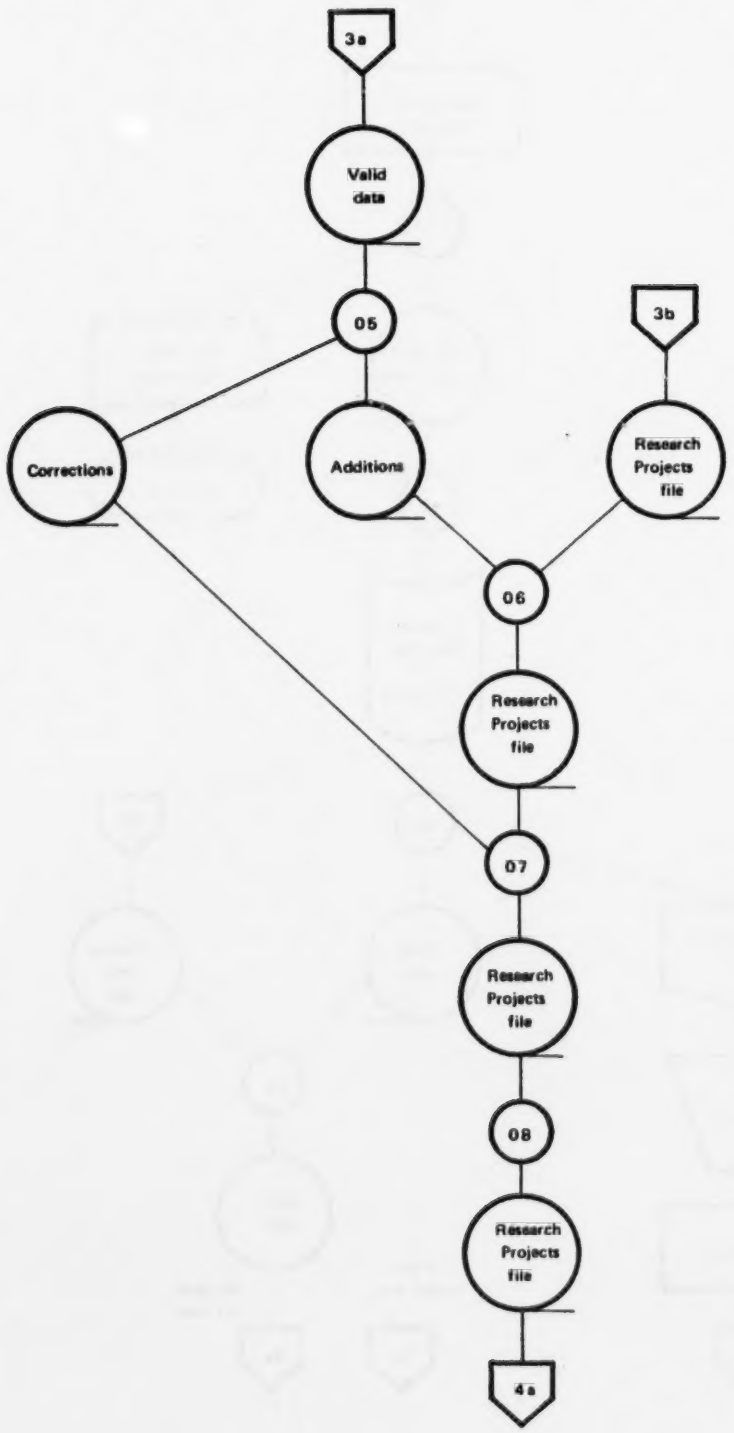
27

A-4 (cont.)

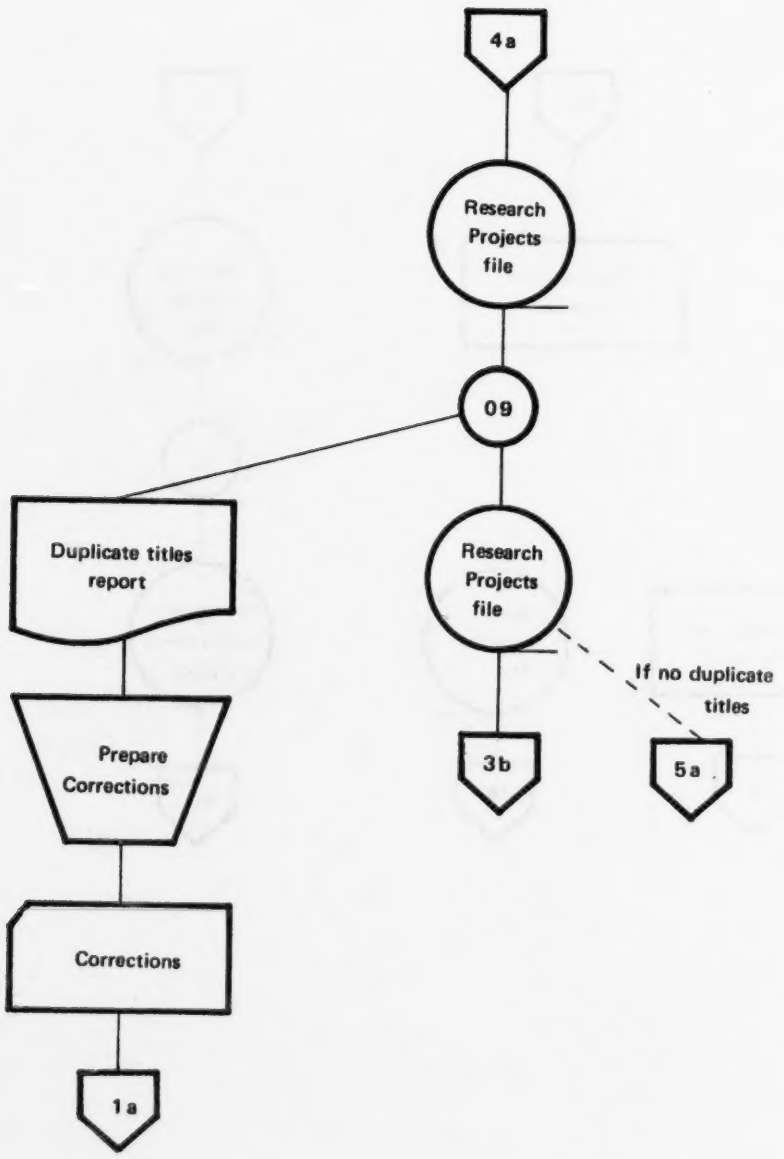

2a
New data + corrections
01
New data + corrections
New data + corrections
02
SAVE
Sorted New data + corrections
03
2b
Invalid data report
Valid data
Previous valid data
Prepare corrections
04
Corecctions
Valid data
If still invalid data
All data are valid
1a
2b
3a

28

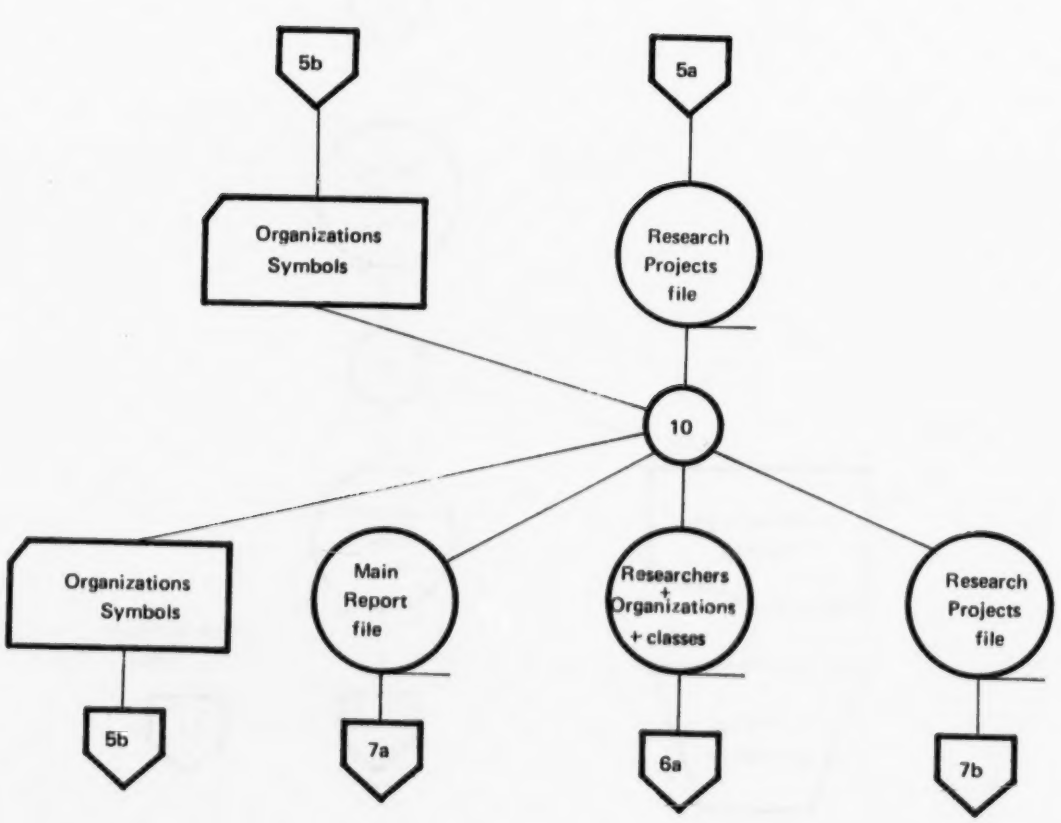
A-4 (cont.)


3a
Valid data
05
3b
Corrections
Additions
Research Projects file
06
Research Projects file
07
Research Projects file
08
Research Projects file
4a

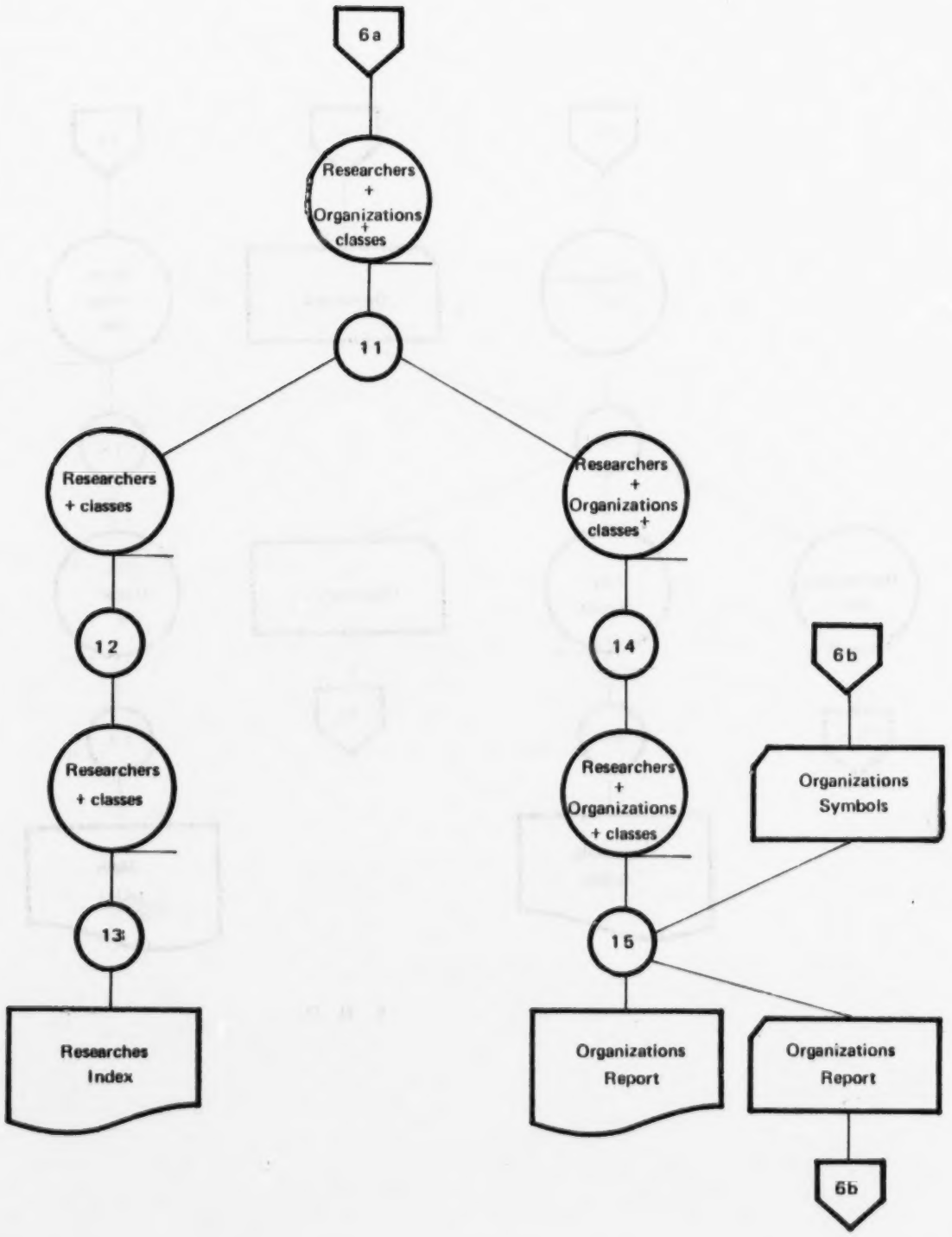
A-4 (cont.)


4a
Research Projects file
09
Duplicate titles report
Research Projects file
If no duplicate titles
Prepare Corrections
3b
5a
Corrections
1a

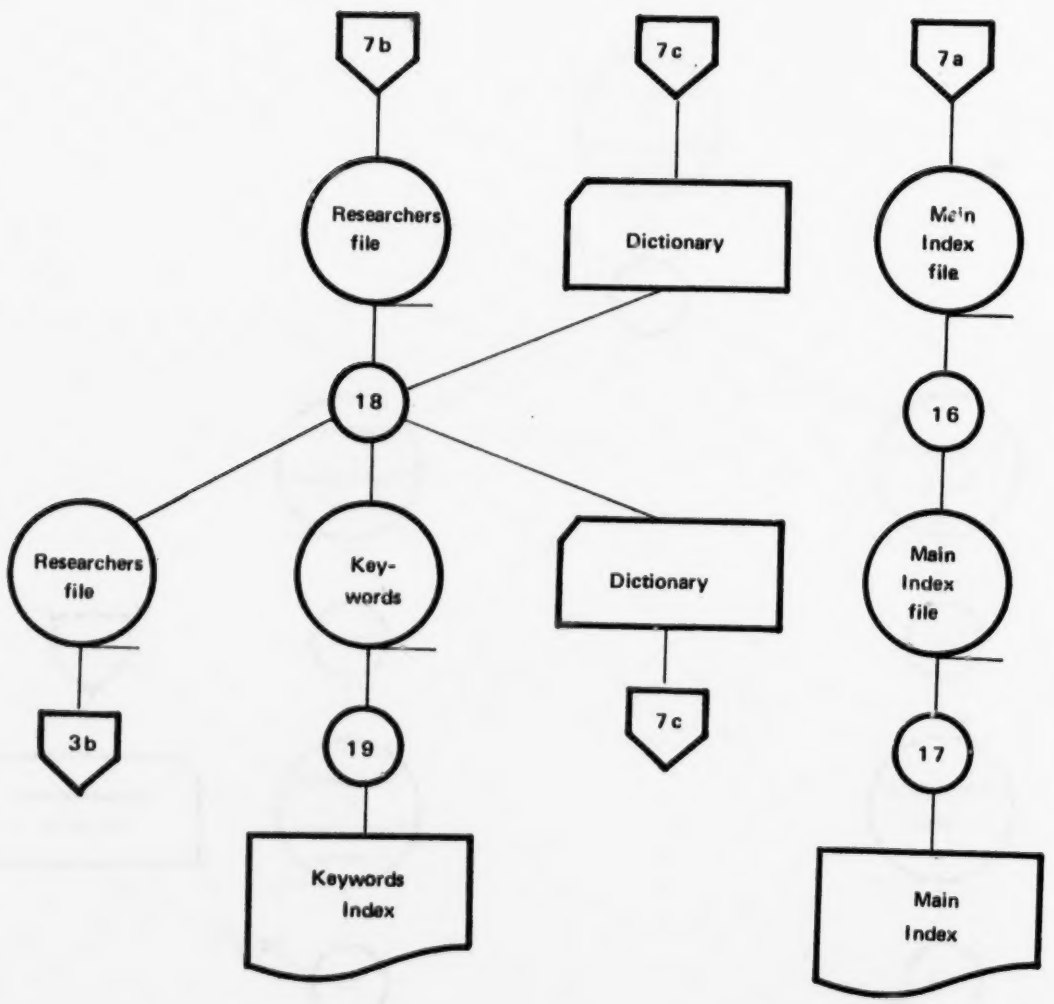
A-4 (cont.)


5b
5a
Organizations Symbols
Research Projects file
10
Organizations Symbols
Main Report file
Researchers + Organizations + classes
Research Projects file
5b
7a
6a
7b

A-4 (cont.)


6a
Researchers + Organizations + classes
11
Researchers + classes
Researchers + Organizations classes +
12
14
6b
Researchers + classes
Researchers + Organizations + classes
Organizations Symbols
13
15
Researches Index
Organizations Report
Organizations Report
6b

A-4 (cont.)


7b
7c
7a
Researchers file
Dictionary
Main Index file
18
16
Researchers file
Key-words
Dictionary
Main Index file
3b
19
7c
17
Keywords Index
Main Index

E N D

PROGRAMS

The programs described below are numbered according to their position in the flow chart in Figure 13. Programs 01 - 06 are maintenance and updating programs; programs 07 - 19 are printing programs.

01. Utility Card-To-Tape Program.
02. Utility Sort Program. Standard Sorting.
03. Logic Test Program, tests the logic of the data, whether numeric fields are truly numeric, and punching and coding errors. Output of this program is a tape of valid data, and an error report.
04. Utility Merge Program
05. Build Program, distinguishes between additions and corrections (old and new records) and while distinguishing, builds new records from the additions.
06. Utility Merge Program.
07. Correction Program, accepts corrections and matches them (according to codes) against the new research projects file.
08. Utility Sort Program.
09. Check Program, checks for duplicate titles and produces a printed report.
10. Extract Program, extracts data from the new Research Projects File and Organizations Symbols card file and builds two new files: one for the Main Report and one for Researchers and Organizations Indices.
11. A program which builds special records from the Researchers and Organizations File for printing the Researchers Index.
12. Utility Sort Program.
13. A program which prints the Researchers Index.
14. Utility Sort Program.
15. A program which prints the Organizations Index.
16. Utility Sort Program.
17. A program which prints the Main Report.
18. A program which builds Keywords File from the new Research Projects File and the punched card dictionary for deleting words.
19. A program which prints the Keyword Index.

CARD FORMATS

The card formats are described below and shown in the attached layouts.

Columns 1-6 & 77-80 are standard in all cards and contain:

1-5 Internal reference number
6 Blank
77 Deletion Code
78 Continuation Code
79 Sequence within type
80 Typ of Card:
- 1 Subject Classes
- 2 Dates, Budget, Sponsors
- 3 Researchers
- 4 Title
- 5 Keywords
- 6 Sponsor & Organization Names and Codes
- 7 Corrections

Card no. 1. Subject Classes.

Column 7. Indicator.
Indicates whether research is in progress or completed.

8. Information available on the project
Space = no information
1 = partial information
2 = full information

9. Type of research
a = applied
b = basic
d.= development

10. Limitation.
If number is smaller or equal to 7 then publishing is limited; if greater than 7 it is unlimited.

11. Abstract. + = abstract available
- = abstract not available

12. Unused

13. Blank

14-69 Subject classes.
There is space for 8 subject classes, each one of them followed by a blank.

70-71 Year of report

Column 72 Blank

73 Status of research
a = applied
w = in progress
f = completed
n = rejected
y = accepted

74-76 Blank

77 Deletion code
Special use in logic test, indicating if this card is to delete a former card equal to it in type, sequence and identification numbers.

78 Continuation code
X = there is a continuous card
A blank card = no continuation

79 Sequence number within card type

80 Card type

Card no. 2. Dates, Budget and Sponsors

Dates

7-10 Starting month and year

11-12 [illegible]tion

13-16 Completion date

17 Blank

Budget (in thousands)

18-21 Annual requested funds

21-25 Annual approved funds

26-30 Total requested funds

31-35 Approved funds

36 Blank

Sponsors

37-39 Sponsor code

40-43 Sponsor's designated funds

Column 44 Blank

45-68 There is space for additional three sponsors codes and designated funds, each followed by a blank.

69-76 Blank

Card no. 3. Researchers (maximum of 4 cards)

7-75 There are no fixed fields. The first position (which may start anywhere) contains a code for the position of the researcher on the project:

* = Israeli project leader
$ = Foreign project leader
& = Foreign scientist (not project leader)
Space = Israeli scientist

Immediately following this code appears the researcher's name containing any characters except left and right parentheses (this limitation may later be changed to exclude other characters than parentheses).

Immediately after the name is a 3 digit code in parentheses representing the organization in which the scientist works, followed by a code indicating the researcher's connection with the project.

R = Released
D = Terminated by death
P = Participating

This record is followed by a comma and the next researcher. A name may be started on one card and continued on the next one.

Card no. 4. Title

Maximum of 4 cards are permitted
The title is written between columns 7 and 75, always followed by a period.

Card no. 5. Keywords

Keywords are written between columns 7 and 75, separated by commas. Words may be started on one card and finished on the next one.

Card no. 6. Sponsor and Organization Names and Codes

(Fixed fields)

7-9	Organization code
10-17	Research project code
18	Blank
19-21	Organizations code
22-29	Research project code
30	Blank
31-33	Sponsors code
34-41	Research project code
42-76	Not used

Card no. 7. Corrections

Maximum of 10 cards starting with sequence nos. (within type 7) from 0-9.

Every correction card is made up of 4 fields: Identification number, code of fields to be corrected, information presently in file and to be corrected, in parentheses, and the corrected information to be added.

7-8	Code of field to be corrected
9	Blank
10-75	Corrections

Information to be added to a record is identified by the record number, and the new information is written beginning in column 10. When a record or piece of information is to be deleted, the existing information is in parentheses beginning in column 10, followed by a comma and the new information inserted in its place.

CARD 1. SUBJECT CLASSES CARD

INTERNAL REFERENCE NUMBER	BLANK	INVESTIGATOR TYPE	INVESTIGATOR TYPE	TYPE OF ACTIVITY	ABSTRACT NOT USED	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	SUBJECT CLASS	BLANK	YEAR OF REPORT	BLANK	STATUS	BLANK	DELETION	CONT.	SEQUENCE	CARD TYPE

CARD 2. BUDGET + SPONSORS CARD

INTERNAL REFERENCE NUMBER	BLANK	STARTING MONTH + YEAR	DURATION	COMPLETION DATE	BLANK	ANNUAL REQUESTED FUNDS	ANNUAL APPROVED FUNDS	TOTAL REQUESTED FUNDS	TOTAL APPROVED FUNDS	BLANK	SPONSOR CODE	SPONSOR'S DESIGNATED FUNDS	BLANK	SPONSOR CODE	SPONSOR'S DESIGNATED FUNDS	BLANK	SPONSOR CODE	SPONSOR'S DESIGNATED FUNDS	BLANK	SPONSOR CODE	SPONSOR'S DESIGNATED FUNDS	BLANK	BLANK	DELETION	CONT.	SEQUENCE	CARD TYPE

CARD 3. RESEARCHERS CARD

INTERNAL REFERENCE NUMBER	BLANK	RESEARCHERS' NAMES	BLANK	DELETION	CONT.	SEQUENCE	CARD TYPE

CARD 4. TITLE CARD

INTERNAL REFERENCE NUMBER	BLANK	TITLE	BLANK	DELETION	CONT.	SEQUENCE	CARD TYPE

CARD FORMATS (cont.)

CARD 5. KEYWORDS CARD

INTERNAL REFERENCE NUMBER	BLANK	KEYWORDS, separated by Commas	BLANK	CONT.	SEQUENCE	CARD TYPE

CARD 6. SPONSORS AND ORGANIZATIONS CODE CARD

INTERNAL REFERENCE NUMBER	BLANK	ORGANIZATIONAL CATEGORY CODE	RESEARCH PROJECT CODE	BLANK	ORGANIZATIONAL CODE	RESEARCH PROJECT CODE	BLANK	SPONSOR'S CODE	SPONSOR'S RESEARCH PROJECT CODE	NOT USED	BLANK	CONT.	SEQUENCE	CARD TYPE

CARD 7. CORRECTIONS CARD

INTERVAL REFERENCE NUMBER	BLANK	FIELD	CODE	BLANK	CORRECTIONS	BLANK	CONT.	SEQUENCE	CARD TYPE

RESEARCH PROJECTS FILE FORMAT

There is only one master file from which temporary files are built by extraction. The file is arranged by internal reference number and contains all the data in each research record, with a limit of 720 characters per entry. The record format is given below.

Item	Columns	Length	Format*	Contents
Research #	1-3	3	P.D.	Internal reference #
Codes	4	1	C	Indicator
	5	1	C	Information
	6	1	C	Type
	7	1	C	Limitation
	8	1	C	Abstract
	9	1	C	Not used
	total	6		
Classes (up to 8 classes)	10-17	8	P.D.	Domain & first 2 classes
	18-27	10	P.D.	Next 3 classes
	28-37	10	P.D.	Last 3 classes
	total	28		
Dates	38-43	6	P.D.	Start, duration, finish
Organizations codes for research (up to 2)	44-45	2	B	1st organization's internal #
	46-53	8	C	1st organization's code
	54-55	2	B	2nd organization's internal #
	56-63	8	C	2nd organization's code
	total	20		
Sponsor's code for research	64-65	2	B	Sponsor's internal #
	66-73	8	C	Sponsor's code for research
	total	10		
	74	1		Not used

* P.D. = Packed decimal B = Binary
C. = Character D = Decimal

Item	Columns	Length	Format	Contents
Total budget	75-80	6	P.D.	Requested and approved total budget
Current year's information	81-82	2	D	Year
	83	1	C	Status of research
	84	1		Not used
	85-89	5	P.D.	Requested and approved yearly budget
	90-105	16	P.D.	4 sponsors and amounts of funding
	total	25		
previous year's information	106-130	same as above		
	total	25		
Researchers	131-330	200	B&C	Example of a name: 11 * FLORIN. A.B. 200 P NEXT ONE
TITLE	331-550	220	C	Title of research project
Keywords	551-720	170	B&C	Example of a keyword: 5 SYSTEM NEXT ONE

TOTAL RECORD LENGTH 720

11 * FLORIN. A.B. 200 P NEXT ONE

- 11 — Length of name - 1
- * — Scientist's position on the project.
- FLORIN. — Scientist's name.
- A.B. — internal number assigned to the organization for which the scientist works
- 200 — Participating scientist
- P — Not used
- NEXT ONE — Not used

5 SYSTEM NEXT ONE

- 5 — Length of keyword - 1
- SYSTEM — Keyword
- NEXT ONE — Not used

The file is updated yearly, with new entries and corrections. From this file all information needed for the separate indices is extracted and special records built for printing.

APPENDIX B - FIGURES 1-8

Figure 1

COSATI SUBJECT CATEGORIES

Field No.

01	Aeronautics	1
02	Agriculture	2
03	Astronomy and Astrophysics	3
04	Atmospheric Sciences	4
05	Behavioral and Social Sciences	5
06	Biological and Medical Sciences	7
07	Chemistry	11
08	Earth Sciences and Oceanography	12
09	Electronics and Electrical Engineering	14
10	Energy Conversion (Non-propulsive)	15
11	Materials	16
12	Mathematical Sciences	18
13	Mechanical, Industrial, Civil, and Marine Engineering	19
14	Methods and Equipment	21
15	Military Sciences	22
16	Missile Technology	24
17	Navigation, Communications, Detection, and Countermeasures	25
18	Nuclear Science and Technology	26
19	Ordnance	28
20	Physics	30
21	Propulsion and Fuels	32
22	Space Technology	34

SAMPLE PAGE OF SUBJECT CATEGORY BREAKDOWN Figure 2

50-09 GENETICS

50-09.01 GENERAL
50-09.02 MATING SYSTEMS
50-09.03 HYBRIDIZATION
50-09.04 CYTOGENETICS
50-09.05 STRUCTURE OF GENETIC MATERIAL
50-09.06 FUNCTION OF GENETIC MATERIAL
50-09.07 QUANTITATIVE AND POPULATION GENETICS
50-09.08 MUTAGENS: CHEMICAL AND RADIATION

50-10 HISTOLOGY

50-11 MORPHOLOGY

50-11.01 MORPHOGENESIS
50-11.12 DESCRIPTIVE MORPHOLOGY

50-12 PHYSIOLOGY

50-12.04 NUTRITION
50-12.05 ENDOCRINOLOGY REGULATION BY HORMONES
50-12.06 IMMUNOLOGY
50-12.07 NEUROPHYSIOLOGY
50-12.08 MUSCLE PHYSIOLOGY
50-12.09 PHYSIOLOGY OF DIGESTION
50-12.10 RESPIRATION: GAS EXCHANGE, ENERGY BALANCE
50-12.11 CIRCULATION PHYSIOLOGY: BLOOD PHYSIOLOGY, CARDIOVASCULAR, TRANSLOCATION
50-12.13 SENSE ORGANS PHYSIOLOGY
50-12.14 REPRODUCTION: SEXUAL, ASEXUAL
50-12.15 TOXICOLOGY
50-12.18 WATER BALANCE
50-12.20 PHOTOSYNTHESIS
50-12.21 MINERAL BALANCE
50-12.22 TEMPERATURE REGULATION
50-12.23 COLOUR CHANGES AND PIGMENTS

50-13 PALEONTOLOGY, ARCHEOLOGY

50-14 SYSTEMATIC BOTANY

50-14.01 ALGAE
50-14.02 FUNGI
50-14.03 LICHENES
50-14.04 BRYOPHYTA
50-14.05 PTERIDOPHYTA
50-14.06 GYMNOSPERMAE
50-14.07 ANGIOSPERMAE

50-15 SYSTEMATIC MICROBIOLOGY

50-15.01 VIRUSES
50-15.02 BACTERIA
50-15.03 BACTERIOPHAGE

50-16 SYSTEMATIC ZOOLOGY

50-16.01 PROTOZOA
50-16.02 PORIFERA
50-16.03 COELENTERATA AND CTENOPHORA
50-16.04 PLATHELMINTHES
50-16.05 NEMATODA AND OTHER MINOR ACAELOMATES
50-16.06 ANNELIDA
50-16.07 ONICHOPHORA AND TRILOBITA
50-16.08 CRUSTACEA
50-16.09 MYRIOPODA
50-16.10 INSECTA
50-16.11 ARACHNIDA
50-16.12 MOLLUSCA
50-16.13 ECTOPROCTA AND OTHER MINOR COELOMATES
50-16.14 ECHINODERMTA
50-16.15 PROTOCHORDATA
50-16.16 PISCES
50-16.17 AMPHIBIA
50-16.18 REPTILIA
50-16.19 AVES
50-16.20 MAMMALIA

50-17 TAXONOMY

50-18 THEORETICAL AND MATHEMATICAL BIOLOGY

50-19 PARASITOLOGY

50-20 BEHAVIOUR

SAMPLE PAGE FROM MAIN SECTION Figure 3

	TITLE OF PROJECT	RESEARCHERS	ORGANIZATION	ORGANIZATION	CLASSES	REF.NO.
	OBSERVATIONS ON FROZEN BEEF FROM VARIOUS SOURCES.	EPSTEIN H.	HUJ AGR BRED		02-03.05	03439
02-01.01	**AGRICULTURAL FINANCE**					
	CAPITAL FORMATION AND GROWTH IN THE ISRAELI COOPERATIVE FARM.	SADAN E.	HUJ AGR ECC			04896
	COMPREHENSIVE PROGRAMMING OF REGIONAL ECONOMIC DEVELOPMENT.	AMIAD A. *KISLEV Y. PLESSNER Y.	HUJ AGR ECC		02-01.02 02-01.03	04988
	INFLUENCE OF PARTICLES FEED VELOCITY AND DIRECTION ON SEPARATING EFFICIENCY IN A VERTICAL AIR SEPARATOR.	YEKUTIELI O.	AGR ENG INST		02-06.06	03809
	MARKETING ORGANIZATION SYSTEMS.	LEV M.	AGR ENG INST		02-01.03	03311
	MONTHLY DEMAND FUNCTIONS FOR VEGETABLES IN ISRAEL.	ADI G. *MUNDLAK Y.	HUJ AGR ECC		02-06.04 02-06.05	04874
	MULTISTAGE MULTIPRODUCT PRODUCTION FUNCTION.	*MUNDLAK Y. RAZIN A.	HUJ AGR ECO		02-01.02 02-01.03	04873
	OPTIMAL MARKETING POLICY OF ISRAEL'S CITRUS FRUITS IN THE MAIN COUNTRIES OF EUROPE.	HOCHMAN E. *PLESSNER Y.	HUJ AGR ECC		02-04.03	05685
	RETURNS AND RISK IN THE COOPERATIVE FARM.	PORAT Y. SADAN E.	HUJ AGR ECC			05159
02-01.03	**FARM MANAGEMENT AND LAND ECONOMICS; EXTENTION AND EDUCATION**					
	AGRICULTURE AND ECONOMIC GROWTH.	MUNDLAK Y.	HUJ AGR ECC			04875
	AGRICULTURE IN THE MIDDLE-EAST.	HURWITZ S.	HUJ AGR CROP			C5932
	AGROECOLOGY.	JUNGWIRTH E.	HUJ AGR EDUC			C5405
	COMPREHENSIVE PLANNING OF A-MOSHAV EMPHASIZING DIRECTION OF SPECIALIZATION.	PLESSNER Y.	HUJ AGR ECC			C5203
	CONSUMPTION PATTERNS OF A COMMUNAL HOUSEHOLD.	GALILLI R. SADAN E. TROPP Z.	HUJ AGR ECO			C5158
	ECONOMIC ANALYSIS OF DRAINAGE PROGRAMS (THE JORDAN RIVER IN THE HULA BASIN).	KISLEV Y.	HUJ AGR ECC		02-02.03	04989
	ECONOMIC ANALYSIS OF MARKETING BOARDS WITH PARTICULAR EMPHASIS ON THE MILK INDUSTRIES.	RIPLAND D. SADAN E.	HUJ AGR ECO			C5160
	ECONOMIC EVALUATION OF WATER QUALITY IN IRRIGATION	YARON D.	HUJ AGR ECO		02-08.05	C5511

DEAD SEA	DEAD SEA WORKS LTD.,BE'ER SHEVA, RESEARCH & DEVELOPMENT LAB
DEAD SEA	DEAD SEA WORKS LTD.,JERUSALEM RESEARCH & DEVELOPMENT LAB
DECO	'DECO', SWISS-ISRAEL DEHYDRATION CO., LTD., TEL-AVIV
DELEK	"DELEK", ISRAEL FUEL CORPORATION
DENTAL SERV	DENTAL SERVICES, TEL-AVIV MUNICIPALITY
DESALINATION	DESALINATION ENGINEERING (ZARCHIN PROCESS)
DONOLO	DONOLO HOSPITAL, YAFFO
DONOLO INST	DONOLO INSTITUTE OF PHYSIOLOGICAL HYGIENE, DONOLO HOSP YAFFO
ELBIT	'ELBIT' LTD. HAIFA
ELCO	'ELCO' ISRAEL ELECTRO-MECHANICAL INDUSTRY LTD. HAIFA
ELRON	'ELRON' ELECTRONIC INDUSTRIES LTD. HAIFA
ELTA	'ELTA' ELECTRONIC INDUSTRIES, LOD AIRPORT
EMEK HOSP	EMEK CENTRAL HOSPITAL, AFULA
ENDOCRINOL	ENDOCRINOLOGY INSTITUTE, TEL-HASHOMER HOSPITAL
FERMENTATION	FERMENTATION UNIT OF THE H-U HADASSAH MEDICAL SCHOOL
FIBRES INST	FIBRES AND FOREST PRODUCTS RESEARCH INSTITUTE, JERUSALEM
FISH BREED	FISH BREEDERS UNION OF ISRAEL-RESEARCH UNIT, HAIFA
FISH CULTURE	FISH CULTURE RESEARCH STATION, OCR
FISH DISEASE	FISH DISEASES LABORATORY, NIR-DAVID
FOOD LAB	FOOD LABORATORIES, TEL-HASHOMER HOSPITAL, RAMAT-GAN
FRUTAROM	'FRUTAROM' ELECTROCHEMICAL INDUSTRIES LTD. HAIFA BAY
GALAM	'GALAM' LTD., LABORATORY, PARDES-HANA
GEHAH HOSP	GEHAH PSYCHIATRIC HOSPITAL, PETAH-TIKVA
GENETICS	HUMAN GENETICS INSTITUTE, TEL-HASHOMER HOSPITAL
GEOLOGY	GEOLOGICAL SURVEY OF ISRAEL, JERUSALEM
H.M.O.	HADASSAH MEDICAL ORGANIZATION
HADASSAH	HADASSAH HOSPITAL, JERUSALEM
HAMGAPER	'HAMGAPER' LTD., RUBBER FACTORY, HAIFA
HANSEN HOSP	HANSEN HOSPITAL, JERUSALEM
HARSA	HARSA LTD.,BEER SHEVA
HASHARON	HASHARON HOSPITAL LABORATORIES,PETAH-TIKVA
HAYES	HAYES (ASHDOD) LTD., RESEARCH & DEVELOPMENT
HEALTH LABS	CENTRAL LABORATORIES, JERUSALEM
HEALTH MIN	MINISTRY OF HEALTH
HEALTH SER	HEALTH SERVICES SCHOOL,TEL-AVIV MUNICIPALITY
HEALTH SERV	HEALTH SERVICES SCHOOL,HADASSAH MEDICAL ORGANIZATION
HEART INST	HEART INSTITUTE,TEL-HASHOMER HOSPITAL
HUJ AGR ANA	HEBREW UNIVERSITY JERUSALEM ANIMAL ANATOMY AND PHYSIOLOGY
HUJ AGR BIOC	HEBREW UNIVERSITY JERUSALEM ANIMAL HUSBANDRY AND BIOCHEMISTRY
HUJ AGR BREED	HEBREW UNIVERSITY JERUSALEM ANIMAL BREEDING
HUJ AGR CROP	HEBREW UNIVERSITY JERUSALEM FIELD AND VEGETABLE CROPS
HUJ AGR ECO	HEBREW UNIVERSITY JERUSALEM AGRICULTURAL ECONOMICS
HUJ AGR EDUC	HEBREW UNIVERSITY JERUSALEM AGRICULTURAL EDUCATION
HUJ AGR ENTO	HEBREW UNIVERSITY JERUSALEM ENTOMOLOGY
HUJ AGR FLOW	HEBREW UNIVERSITY JERUSALEM FLOWERS
HUJ AGR FOOD	HEBREW UNIVERSITY JERUSALEM FOOD TECHNOLOGY
HUJ AGR HORT	HEBREW UNIVERSITY JERUSALEM HORTICULTURE
HUJ AGR HUSB	HEBREW UNIVERSITY JERUSALEM ANIMAL HUSBANDRY
HUJ AGR IRR	HEBREW UNIVERSITY JERUSALEM IRRIGATION
HUJ AGR NUTR	HEBREW UNIVERSITY JERUSALEM ANIMAL NUTRITION AND AGRCAL BIOCHEM
HUJ AGR PATH	HEBREW UNIVERSITY JERUSALEM PLANT PATHOLOGY
HUJ AGR PLNT	HEBREW UNIVERSITY JERUSALEM PLANT PHYSIOLOGY
HUJ AGR POUL	HEBREW UNIVERSITY JERUSALEM POULTRY SCIENCE AND ANIMAL HYGIENE
HUJ AGR SOIL	HEBREW UNIVERSITY JERUSALEM SOIL SCIENCE
HUJ APPL LOG	HEBREW UNIVERSITY JERUSALEM APPLIED LOGIC
HUJ ARCH	HEBREW UNIVERSITY JERUSALEM ARCHEOLOGY

SAMPLE PAGE FROM
ORGANIZATIONS SYMBOLS

Figure 4

SAMPLE PAGE FROM ORGANIZATIONS INDEX

Figure 5

```
GALAN          07-02.02
GEHAM HOSP     05-17.01 51-17.06
GENETICS       51-09.02
GEOLOGY        08-03.01 08-04.01 08-07.01 08-07.03 08-07.04 08-07.05 08-07.06 08-08.00 08-09.01 08-10.00
H.M.O.         05-11.09 51-19.01
HADASSAH       51-07.03 51-13.06 51-13.10 51-17.06 51-19.01
HANSEN HOSP    50-12.08 50-15.02 51-01.09 51-03.06 51-10.05 51-13.01 51-14.29
HARSA          13-02.00
HASHARON       50-03.05
HAYES          02-09.01 02-09.04
HEALTH LABS    51-09.02 51-13.01 51-13.27 51-16.03 51-19.01
HEALTH MIN     51-13.17 51-13.25
HEALTH SER     51-15.12
HEALTH SERV    51-19.01
HEART INST     51-07.02 51-07.03
HUJ AGR ANA    50-01.06 50-04.03 50-15.01 51-13.06 51-14.46
HUJ AGR BIOC   02-03.01 02-03.04 02-03.10 02-05.02 50-16.10
HUJ AGR BRED   02-01.00 02-03.01 02-03.03 02-03.05 02-03.07 02-03.13 51-13.07
HUJ AGR CROP   02-01.03 02-03.11 02-05.01 02-05.02 02-05.04 02-05.05 02-06.06 02-07.06 02-08.02 02-10.00 02-11.00 50-09.04 50-09.07
HUJ AGR ECO    02-01.01 02-01.03 02-08.05 12-06.02 12-10.00
HUJ AGR EDUC   02-01.03 05-06.00 05-09.00
HUJ AGR ENTO   02-03.11 02-05.02 02-07.01 02-07.05 02-09.13 50-03.07 50-03.13 50-16.10 50-19.00
HUJ AGR FLOW   02-05.05 02-06.06 02-06.09 02-11.00
HUJ AGR HORT   02-04.01 02-04.02 02-04.03 02-04.05 02-06.09 02-07.06 02-08.05 02-08.07 02-09.02 02-09.13 02-10.00 02-11.00 50-03.13
               50-04.06
HUJ AGR HUSB   02-03.01 02-07.04
HUJ AGR IRR    02-04.03 02-08.01 02-08.03 02-08.04 02-08.05 02-11.00
HUJ AGR NUTR   02-03.04 02-03.08 02-05.02 02-07.05 02-09.06 50-03.05 50-09.10
HUJ AGR PATH   02-05.05 02-06.09 02-07.01 02-07.07
HUJ AGR PLNT   02-04.07 02-05.02 02-11.00 20-04.02
HUJ AGR POUL   02-03.08 50-03.13 50-12.07
HUJ AGR SOIL   02-04.05 02-07.01 02-08.01 02-08.02 02-08.03 02-08.05 02-08.07 02-09.06 02-11.00 08-07.01 50-03.06 50-14.02 50-15.02
HUJ ARCH       08-07.05 50-13.00 51-17.06
HUJ BIOLCHEM   07-05.02 07-05.09 50-03.05 50-03.06 50-03.07 50-03.14 50-04.02 50-04.05 50-12.08 50-15.02 51-03.04 51-03.09 51-07.01
               51-13.27 51-14.05
HUJ BOTANY     02-04.06 02-04.10 02-05.02 02-05.05 02-07.01 02-08.05 02-08.07 02-11.00 05-06.00 07-06.11 50-01.01 50-01.04 50-03.01
               50-03.04 50-03.05 50-03.06 50-03.11 50-03.13 50-03.14 50-04.03 50-04.07 50-05.00 50-06.04 50-06.05 50-06.20 50-07.01
               50-07.08 50-07.09 50-07.10 50-07.51 50-09.02 50-09.04 50-09.07 50-10.00 50-11.01 50-11.12 50-12.05 50-12.21 50-14.01
               50-14.02 50-14.06 50-14.07 50-17.00
HUJ CHEM LAB   07-05.01 07-05.03 07-05.11 50-03.04 50-03.05 50-03.06 50-03.09 50-15.02 51-07.02 51-11.01
HUJ DNT ANES   50-06.30 51-02.01
HUJ DNT GRAM   50-12.13 51-02.03 51-02.08 51-09.04 51-10.03 51-13.12 51-13.15 51-13.27 51-15.01 51-15.02 51-15.10
HUJ DNT GRAR   50-12.08 51-03.06 51-15.02
HUJ DNT PERI   51-13.07 51-13.15 51-13.27 51-15.02
HUJ DNT PREV   51-02.08 51-15.02
HUJ DNT RESC   50-01.01 50-12.06 50-12.07 50-12.08 50-12.13 51 02.04 51-03.09 51-07.03 51-11.03 51-13.01 51-13.12 51-13.27 51-16.03
HUJ DNT TISS   51-02.01
HUJ ENTCND     02-04.03 02-05.05 02-07.01 02-07.05 50-06.01 50-06.30 50-07.00 50-07.40 50-12.05 50-12.06 50-12.08 50-12.13 50-12.14
               50-12.23 50-16.10 50-16.11 50-16.18 50-19.00 50-20.00 51-09.02 51-14.46
HUJ EXP PHYS   11-05.00 20-01.01 20-01.02 20-01.04 20-02.01 20-02.02 20-02.03 20-02.04 20-03.02 20-03.05 20-04.01 20-04.02 20-04.03
               20-04.04 20-04.05 20-04.06 20-04.07 20-04.09 20-05.01 20-05.02 20-05.03 20-05.06 20-05.07 20-06.09 20-20.01 20-20.10
HUJ GENETICS   02-03.03 02-03.12 02-07.01 50-03.06 50-07.00 50-08.00 50-09.01 50-09.04 50-09.05 50-09.06 50-09.07 50-09.08 50-13.00
               50-16.10 50-16.17 50-18.09 51-11.01 51-13.07 51-13.14 51-13.17 51-17.05 51-17.06  0-05.00
HUJ GEOGRAPH   04-02.00 08-06.00 08-08.00 14-02.00
HUJ GEOLOGY    02-08.00 02-09.01 08-04.01 08-06.01 08-07.02 08-07.01 08-07.02 08-07.03 08-07.04 08-07.05 08-07.06 08-08.01 20-04.05
```

SAMPLE PAGE FROM
RESEARCHERS INDEX

Figure 6

FRIED K. 51-13.07 51-17.08 51-19.02
FRIEDBERG D. 50-15.02
FRIEDBERG I. 50-03.14 50-15.02
FRIEDENBERG J. 02-07.08
FRIEDKIND S. 50-15.02
FRIEDLANDER A. 51-17.07
FRIEDLANDER M. 50-09.04 50-16.10
FRIEDMAN E. 20-05.02 20-05.03 20-05.06 20-05.07
FRIEDMAN G.M. 08-07.01 08-07.03
FRIEDMAN J. 50-07.09
FRIEDMAN M. 20-03.02
FRIEDMAN M.A. 02-08.03
FRIEDMAN P.E. 50-03.06
FRIEDMAN M.R. 07-02.08
FRIEDMAN S. 51-05.02 51-17.07
FRIEDMAN Y. 51-07.03
FRIEDMANN A. 50-15.03
FRIEDMANN F. 09-02.00
FRIENKIEL J. 13-10.00
FROHLICH A. 20-06.01 20-06.09
FROHWEIN Y.Z. 07-05.03 50-03.05 50-03.08
FROINDLICH C. 20-05.02 20-05.03
FROMMER M.A. 07-05.12
FRUMKIN N. 51-13.07
FRY M. 50-03.07
FRY-SHAFRIR I. 07-05.02
FRYDMAN M. 05-08.00
FRYDMAN N. 07-05.04
FRYDMAN-CHABELSKA CH. 11-12.00
FUCHS B. 07-05.04
FUHRMANN P.A. 12-02.00
FUKS P. 51-14.35
FURSSMANN W. 50-03.09
FURSTENBERG H. 12-11.00
GAASH D. 02-04.01
GAATON A. 07-07.04
GABBAY Y. 07-05.02 07-05.12
GABIZON R. 08-08.00
GABRIEL K.R. 04-01.00 12-10.00
GABRIEL S. 09-03.00
GAFNI J. 51-10.05
GAFNI M. 51-06.08
GAGIN A. 04-01.00
GAIRON S. 02-08.05
GAIST L. 50-03.05
GAL A. 07-06.09
GAL J. 20-05.03
GAL M. 02-08.01 02-08.02
GALANTI Y. 50-03.08
GALAY A. 08-08.00
GALBER H. 51-13.07
GALE J. 02-04.06 02-08.05 02-11.00
GALEWSKI K. 50-03.04 51-07.01 51-11.01
GALILI N. 13-09.00 51-18.04

SAMPLE PAGE FROM THE KWOC INDEX

Figure 7

KEYWORD	TITLE OF PROJECT	FIELD
	DEVELOPMENT OF A MACHINE FOR AUTOMATIC WRAPPING OF CITRUS FRUITS.	02-02.01
WRINKLE	FUNDAMENTAL INVESTIGATION OF THE GEOMETRY OF WRINKLES AS THEY AFFECT COTTON FABRICS.	11-05.00
WRITING	DIRECTIONALITY, HAND-EYE-CEREBRAL DOMINANCE,. READING-WRITING HABITS: DEVELOPMENTAL. CULTURAL.	51-16.04
X-RAY	ANOMALOUS TRANSMISSION OF X-RAYS IN THE MULTIPLE RAY CASE.	20-04.02
	ANOMALOUS TRANSMISSION IN STRAINED DUCTILE AND BRITTLE CRYSTALS BY THE DIVERGENT X-RAY BEAM.	20-04.03
	DEVELOPMENT OF A FLASH X-RAY TUBE.	20-03.05
	DEVELOPMENT OF FERROMAGNETIC MATERIALS FOR X-RAY DIAGNOSIS OF THE GASTRO-INTESTINAL TRACT.	20-04.01
	EFFECT OF X-IRRADIATION OF THE HEAD ON THE THYMUS AND THE SPLEEN.	51-15.11
	ELEVATION OF THE DIAPHRAGM AND UNILATERAL PNEUMONIA IN HEMIPLEGIA AS EVIDENCE IN X-RAY PHOTOGRAPHS.	51-13.18
	ESTIMATION OF GASTRIC ACIDITY BY X-RAY.	51-03.05
	FABRICATION OF SOLID-STATE RADIATION DETECTORS (ESPECIALLY NUCLEAR AND X-RAY RADIATION DETECTORS.)	20-20.10
	FERRITIES AS CONTRAST MATERIALS FOR GASTRO-INTESTINAL X-RAY DIAGNOSIS.	51-03.05
	INVESTIGATION OF THE DIFFRACTION OF X-RAYS BY THIN IDEAL CRYSTALS ACCORDING TO THE DYNAMIC THEORY.	20-04.02
	METHOD OF QUANTITATIVE MINERALOGICAL ANALYSIS OF CALCITE AND MG-CALCITE BY X-RAY DIFFRACTION.	08-07.01
	SURVEY OF THE OPERATION OF DENTAL X-RAY APPARATUS IN ISRAEL.	51-15.02
	THERMALLY STIMULATED CURRENT AND THERMALLY LUMINESCENCE IN X-COLORED ALKALI-HALIDES.	20-04.02
	X-RAY DIFFRACTION STUDIES OF LIQUID METALS AND THEIR RELATIONSHIP TO TRANSPORT PROPERTIES.	20-04.05
	LIGHT AND CURRENT PULSES IN X-RAYED POTASSIUM DIHYDROGEN PHOSPHATE CRYSTALS.	20-04.09
XANTHINE	COMPLEXATION OF XANTHINE DERIVATIVES.	07-05.08
	COMPLEXATION PROPERTIES OF SOME FRAGMENTS OF THE XANTHINE.	07-05.07
XERIC SKIN	PARTIAL BLOCKAGE. RETICULOENDOTHELIAL SYSTEM. SILICON FLUID (DIMETYLPOLYSITOXANE). IMMUNOLOGICAL.	51-15.08
XENON	ONE STEP SYNTHESIS OF IODINE-125 LABELLED MOLECULES USING ELECTRON CAPTURE DECAY OF XENON-125.	07-07.01
	OPTICAL PROPERTIES OF SOLID XENON IN THE 1150-1160 A REGION.	20-04.02
	SYNTHETIC STUDIES; 2.COMPLEX OF XEF2.ASF5.	07-04.03
XENOPSYLLA	HYGROREACTION OF THE LARVAE OF THE ORIENTAL RAT FLEA XENOPSYLLA ROTSCH, (SIPHONAPTERA; PULICIDAE).	50-07.08
XENOTIME	NONDESTRUCTIVE ANALYSIS OF SOME LANTHANIDE ELEMENTS IN A XENOTIME SAMPLE.	07-01.03
XPP-APINASE	CONFORMATIVE RESPONSE PATTERNS IN XPP-APINASE.	50-03.05
XYLEM	INDUCTION OF XYLEM DIFFERENTIATION.	50-03.13
XYLINUM	IMPLICATION OF THE DIRECT PHOSPHORYLATION OF PYRUVATE IN CELLULOSE SYNTHESIS IN ACETOBACTER XYLINUM.	50-15.02
YEAST	EFFECT OF YEAST EXTRACT AND CASITONE ON THE RESPONSE OF MICROORGANISMS TO SODIUM CHLORIDE.	02-08.01
	METABOLIC INHIBITORS. THE NUCLEOTIDE POOL AND SUBCELLULAR STRUCTURES IN YEAST.	50-03.07
	PILOT PLANT SCALE RESEARCH AND DEVELOPMENT OF FERMENTATION PROCESSES.	07-02.08
	PRODUCTION OF CARCINOGENIC YEAST.	07-02.08
YEMENITE	ALPHA THALASSEMIA IN ISRAELI COMMUNITIES.	51-13.19
	COMPARATIVE GENETICS OF SUB-GROUPS AMONG THE YEMENITES.	02-03.04
YIELD	ACCELERATION OF PLANT GROWTH AND INCREASE IN CROP YIELD BY IRRADIATION OF SEEDS.	50-04.06
	COMULATIVE AND INDEPENDENT YIELDS IN THERMAL NEUTRON FISSION OF 233U.	20-05.09
	EFFECT OF IRRIGATION INTERVALS ON THE YIELDS AND THE WATER REGIME OF A DROP-IRRIGATED VINEYARD.	02-08.05
	EFFECT OF PROCESSING CONDITIONS ON THE YIELD AND QUALITY OF ISOLATED SOYBEAN PROTEIN.	02-09.04
	EFFECT. N-FERTILIZER. CUTTING FREQUENCIES. YIELD, PERSISTANCE. NUTRITIVE VALUE. RHODES GRASS.	02-05.02
	EFFECTS. CONSIDERABLE REDUCTION. INTENSITY. SPRINKLER IRRIGATION. INCREASED YIELDS DECREASE. WATER.	02-08.01
	EFFECTS. NA, K,. N. UPTAKE. NUTRIENT ELEMENTS. YIELD. QALITY COMPOSITION. SUGAR BEET. ESTIMATION.	02-08.02
	EVALUATION. EFFECT. IRRIGATION METHODOLOGY. YIELDS. VARIOUS CROPS. EL-ARISH REGION.	02-08.05
	RUNOFF, EROSION AND YIELDS IN WINTER GRAINS AS EFFECTED BY DIFFERENT SEED-BEDS IN SOUTHERN ISRAEL.	02-08.06
	SOIL TILLAGE PRACTICES TO MINIMIZE SOIL COMPACTION ON HEAVY SOILS FOR DRY FARMING CROPS.	02-08.06
YIZRAEL	HYDROGEOLOGY. HYDROGEOCHEMISTRY. INTERIOR VALLEYS. NORTHERN ISRAEL (ZEVULUN,YIZRA'EL,HAROD,BET.	08-04.00
YOUNG	EVALUATION OF THE CARE OF YOUNG PEOPLE WITH RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE.	51-07.03
YTTRIUM	DETERMINATION. CRYSTAL STRUCTURE. YTTRIUM ORTHOFERRITE. REFINEMENT. GADOLINIUM ORTHOFERRITE.	20-04.02

Figure 8

SUBJECT CATEGORIES
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01 Aeronautics 1
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18 Nuclear Sciences and Technology 171
20 Physics 175
21 Propulsion and Fuels 211
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of COSATI 06 (51 Medicine 277

פירסום מונוגרפיה זו, שתוכנה מבוסס על שיטות העבודה שהונהגו בהכנתו של ה"מדריך למחקר המדעי השוטף בישראל" – בהוצאתו של המרכז למידע טכנולוגי ומדעי – היה מתוכנן עוד לינואר 1968.

נוכח ההחלטה להוציא את מהדורתו השנייה של המדריך תוך שינויים מסוימים היה נראה לנו עדיף להשהות את פירסום המונוגרפיה לזמן מה כדי לכלול בה גם את הלקח שהופק מפירסום המהדורה הראשונה.

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כתב מס' 2 ערוך בידי ש. תומס

כתבים בנושאי מידע

מס׳ 2

אגודת הספריות המיוחדות ומרכזי המידע בישראל

אסמ"י

ק. קרן, ב. ארבל, נ. פיכמן, ח. פרנס

מפתח ממוכן
למחקר המדעי השוטף בישראל

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